



## Course Specifications

<b>Course Title:</b>	<b>Plant Physiology (1)</b>
<b>Course Code:</b>	<b>2013106-3</b>
<b>Program:</b>	<b>Bachelor in Botany</b>
<b>Department:</b>	<b>Biology Department</b>
<b>College:</b>	<b>College of Sciences</b>
<b>Institution:</b>	<b>Taif University</b>

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## A. Course Identification

<b>1. Credit hours:</b> 3 hr
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 8 <sup>th</sup> level / 3 <sup>rd</sup> year
<b>4. Pre-requisites for this course (if any):</b> General Botany 2012103-3
<b>5. Co-requisites for this course (if any):</b> None

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	6 hr/Week	100%
2	Blended	-	-
3	E-learning	-	-
4	Distance learning	-	-
5	Other	-	-

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	20
3	Tutorial	-
4	Others (specify)	-
	<b>Total</b>	<b>50</b>

## B. Course Objectives and Learning Outcomes

<b>1. Course Description</b> This course deals with studying introduction to plant physiology, water absorption and sap uptake, transpiration, osmosis, plasmolysis, deplasmolysis, permeability of membrane, and phloem translocation.
<b>2. Course Main Objective</b> The course covers items related to basic concepts in plant physiology, physiological processes and mechanisms of water and mineral uptake at cell and whole plant level, relationship between physiological processes and other related scientific fields as well as plants response to environmental conditions.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge and Understanding</b>	
1.1	Outline the basic and sophisticated physiological processes that occur	K1

CLOs		Aligned PLOs
	in plant.	
1.2	Define the physiological theories as well as scientific tools and equipment used in studying plant physiology.	K3
<b>2</b>	<b>Skills:</b>	
2.1	Analyze the mechanisms of water and nutrient absorption by plants.	S2
2.2	Illustrate functions of various macromolecules in different plant physiological processes.	S4
<b>3</b>	<b>Values:</b>	
3.1	Develop plans to perform specific tasks independently and as a team member.	V1

### C. Course Content

No	List of Topics	Contact Hours
1	<b>Section 1: Plant water relations</b> - At cellular level - At sol solution. - Water transport processes - Mass flow and diffusion	3L+2P
2	<b>Section 2: Diffusion</b> - Qualitative description of diffusion - Quantitative description of diffusion - Osmosis	3L+2P
3	<b>Section 3: Water potential</b> - Chemical potential of water - Concept of water potential - Component of water potential in solution and plant cell	6L+4P
4	<b>Section 4: Plasmolysis and Deplasmolysis</b> - Hofler diagram - Plasmolysis - Deplasmolysis	6L+4P
5	<b>Section 5: Membrane permeability</b> - Membrane composition and structure - Passive permeability and active mineral transport	3L+2P
6	<b>Section 6: Whole plant water relations</b> - Mechanisms of water absorption - Mechanism of stomatal opening and closing.	3L+2P
7	<b>Section 7: Phloem translocation</b> - Phloem structure - Phloem loading - Phloem unloading	3L+2P
8	<b>General Revision</b>	3L+2P
<b>Total</b>		<b>30L + 20P</b>

### D. Teaching and Assessment

#### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1	Outline the basic and sophisticated physiological processes that occur in plant.	Lectures Cooperative learning	Paper-based exams
1.2	Define the physiological theories as well as scientific tools and equipment used in studying plant physiology.	Lectures Open discussion	Paper-based exams
2.0	<b>Skills</b>		
2.1	Analyze the mechanisms of water and nutrient absorption by plants.	Lectures Brain storming	Paper-based exams Practical reports
2.2	Illustrate functions of various macromolecules in different plant physiological processes.	Interactive learning Open discussion	Final practical exam
3.0	<b>Values</b>		
3.1	Develop plans to perform specific tasks independently and as a team member.	Small group activities Interactive learning	Activities evaluation

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm Exam	5 <sup>th</sup>	20%
2	Semester Activities	Periodic	10%
3	Practical Reports	Weekly	20%
4	Final Practical Exam	11 <sup>th</sup>	10%
5	Final Exam	12 <sup>th</sup>	40%
<b>Total</b>			<b>100%</b>

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:**

6 hours per week (as defined in the teaching schedule of the faculty member) for academic advice and consultations.

Teaching staff is also available using Blackboard web site and Taif University “Edugate” System.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<ul style="list-style-type: none"> <li>- Yeo, A.R. and Flowers, T.J. (2008). Plant Solute Transport. John Wiley &amp; Sons.</li> <li>- Mohr, H. and Schopfer, P. (2012). Plant Physiology. Springer Science &amp; Business Media.</li> </ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>- Bhatla, S.C. and Lal, M.A. (2018). Plant Physiology: Development and Metabolism. Springer.</li> </ul>
<b>Electronic Materials</b>	Blackboard website Website of Saudi digital Library
<b>Other Learning Materials</b>	Computer-based programs and professional software

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> <li>- Classrooms for 40 students\lecture.</li> <li>- Laboratory for 20 students\ lab activity</li> </ul>
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Data show.
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> <li>- Slide projector.</li> <li>- Permanent slides.</li> <li>- Preserved specimens</li> </ul>

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Indirect
Quality of learning resources	Peer Reviewer Students	Direct Indirect
Extent of achieving the course learning outcomes	Peer Reviewer Students	Direct Indirect

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	<b>Biology Department</b>
<b>Reference No.</b>	<b>Committee number 14 - Academic Year 1442-1443H</b>
<b>Date</b>	<b>22\5\2022G – 21\10\1443H</b>